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L4: Entry 9 of 9

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TITLE: Defoliant

Abstract Text (1):

A mixture, comprising (A) thidiazuron or thidiazuron and diuron and (B) one or more PPO inhibitors of the formula (I)

Brief Summary Text (5):

Surprisingly, it has now been found that thidiazuron in mixtures with certain herbicides which inhibit the activity of the enzyme protoporphyrinogen-(IX) oxidase (PPO inhibitors) has synergistic effects.

Brief Summary Text (11):

The present invention accordingly provides the use of a mixture comprising (A) thidiazuron or thidiazuron and diuron and (B) one or more PPO inhibitors of the formula (I)

Brief Summary Paragraph Table (2):

TABLE 2 Chemical Name Technical Structural formula or Code No. description ##STR16##
F-5231 WO 85/01939 ##STR17## nipyraclofen EP-A-0 154 115 ##STR18## KPP-300 WO
87/02357 ##STR19## pyrazogyl (proposed) or pyraclonil (proposed) WO 94/08999
##STR20## sulfentrazones GB-A 2 230 261 ##STR21## pentoaxazones WO 87/02357 ##STR22##
flupropacil CH 87-2330 WO 88/10254 ##STR23## M&B-39279 GB-A 81-22146 ##STR24##
thidiazimin EP-A 0 311 135 ##STR25## carfentrazone- ethyl WO 90/02120 ##STR26##
fluthiacet-methyl U.S. Pat. No. 4,885,023 EP-A 0 273 417 ##STR27## pyraflufen-ethyl
EP-A 0 361 114 JP-A 88-217164 ##STR28## oxadiargyl DE-A 2 227 012 ##STR29##
azafenidine DE-A 2 801 429 U.S. Pat. No. 5,332,718 ##STR30## fluazolate WO 92/06962
##STR31## butafenacil or fluobutracil (proposed) WO 91/00278 ##STR32## oxadiazon
GB-A 1,110,500 ##STR33## benzfendizone (proposed) U.S. Pat. No. 5,344,812

CLAIMS:

1. A method for effecting leaf abscission in plants which comprises treating plants with a mixture comprising (A) thidiazuron or thidiazuron and diuron and (B) one or more PPO inhibitors of the formula (I)

W--V (I), for effecting leaf abscission of plants,

where the symbols in the formula (I) have the meanings: ##STR34##

and ##STR35##

or ##STR36##

and ##STR37##

or ##STR38##

and ##STR39## R.¹ is hydrogen or halogen; R.² is halogen, alkyl, alkoxy, haloalkoxy or haloalkyl; R.³ is hydrogen, alkyl, haloalkyl, alkoxy, haloalkoxy, alkyl-S(O).sub.n --, dialkylamino, alkylamino, amino or halogen; R.⁴ is

hydrogen, alkyl, haloalkyl, alkenyl, haloalkenyl, alkynyl, haloalkynyl, formyl, alkyl-CO-- or amino; R.sup.5 is hydrogen, halogen, alkyl, haloalkyl or nitro; R.sup.6 is hydrogen, alkyl or haloalkyl; R.sup.7 is hydrogen, alkyl or haloalkyl; R.sup.8 is hydrogen, alkyl, haloalkyl, alkenyl, haloalkenyl, alkynyl or haloalkynyl; R.sup.9 is hydrogen, alkyl, halogen, alkoxy, haloalkyl, haloalkoxy, alkoxy carbonyl, haloalkoxycarbonyl or amino; R.sup.10 is hydrogen, alkyl, halogen, alkoxy, haloalkyl, haloalkoxy, alkoxy carbonyl, haloalkoxycarbonyl or amino; R.sup.11 is hydrogen or alkyl; R.sup.12 is hydrogen, alkyl or halogen; R.sup.13 is hydrogen, halogen, alkyl, haloalkyl, alkoxy, haloalkoxy, cyano, nitro, amino, alkylamino, dialkylamino, alkoxy carbonyl, -(C.dbd.O)NH.sup.2, -(C.dbd.S)NH.sup.2, hydroxyl, acyloxy, substituted phenyl, substituted phenoxy, substituted benzyl or substituted benzyl oxy; R.sup.14 is hydrogen, alkyl, haloalkyl, alkoxy alkyl, haloalkoxy alkyl, alkenyl, haloalkoxy alkenyl, alkynyl, haloalkynyl, alkoxy, haloalkoxy, haloalkenyl oxy, alkynyl oxy, haloalkynyl oxy, halogen, --O--COR.sup.15, --OH, --S(O).sub.n R.sup.15, --COR.sup.17, --CONR.sup.18 R.sup.19, --CO.sub.2 R.sup.20, --(CR.sup.6 R.sup.7).sub.n --CO.sub.2 R.sup.20, --CR.sup.21.dbd.CR.sup.22 CO.sup.2 R.sup.20, --CN, --CR.sup.11 (X.sup.1 R.sup.23) (X.sup.2 R.sup.24), --NR.sup.11 --(CR.sup.6 R.sup.7).sub.n --CO.sub.2 R.sup.20, --O--(CR.sup.6 R.sup.7).sub.n --CO.sub.2 R.sup.20, --S(O).sub.n --CR.sup.21.dbd.CR.sup.22 --C(O)NR.sup.16 R.sup.17, --(CR.sup.6 R.sup.7).sub.n CONR.sup.16 R.sup.17, --(CR.sup.6 R.sup.7).sub.n --CO.sub.2 R.sup.20, --NO.sub.2, --NR.sup.16 R.sup.17, --NR.sup.24 SO.sub.2 R.sup.15 or --NR.sup.23 COR.sup.15 ; R.sup.15 is hydrogen, M, alkyl, haloalkyl, alkenyl, haloalkenyl, alkynyl, haloalkynyl or halogen; R.sup.16 is hydrogen, alkyl, haloalkyl, alkenyl, haloalkenyl, alkynyl, haloalkynyl or halogen; R.sup.17 is hydrogen, OH, OM, alkyl, haloalkyl, alkenyl, haloalkenyl, alkynyl, haloalkynyl, alkoxy alkyl or haloalkoxy alkyl; R.sup.18 is hydrogen, alkyl, alkoxy, alkenyl, haloalkenyl, alkynyl or haloalkynyl; R.sup.19 is hydrogen, alkyl, alkoxy or R.sup.18 and R.sup.19 together with the nitrogen atom form a 5-, 6- or 7-membered ring which may be interrupted by oxygen or sulfur; R.sup.20 is hydrogen, M, alkyl, haloalkyl, alkenyl, haloalkenyl, alkynyl, haloalkynyl, alkoxy alkyl, haloalkoxy alkyl or --(CR.sup.6 R.sup.7).sub.n --CO.sub.2 R.sup.15 ; R.sup.21 is hydrogen, alkyl, halogen or CN, R.sup.22 is hydrogen, alkyl, halogen or CN; R.sup.23 is hydrogen or alkyl; R.sup.24 is hydrogen, alkyl or R.sup.23 and R.sup.24 together are a substituted or else unsubstituted 5-, 6 or 7-membered cyclic acetal or thioacetal; R.sup.25 is hydrogen, alkyl, alkoxy, alkenyl, haloalkenyl, alkynyl, haloalkynyl, carbamoyl or thiocarbamoyl; M is an alkali metal, alkaline earth metal or ammonium ion; X.sup.1 is identical or different and is C-R.sup.5 or N; X.sup.2 is identical or different and is CR.sup.2 R.sup.6, O, --S(O).sub.n -- or NR.sup.25 ; Y.sup.1 is O or S; Y.sup.2 is O or S; n, are 0, 1 or 2; U.sup.1 is O, S(O).sub.n, NR.sup.23 or CR.sup.9 R.sup.10. U.sup.2 is S(O).sub.n, CR.sup.9 R.sup.10 or C.dbd.O; T is CR.sup.2 R.sup.6, NH or NR.sup.2.

4. The method for effecting leaf abscission in plants which comprises treating the plants with a mixture comprising (A) thidiazuron or thidiazuron and diuron and (B) one or more PPO inhibitors selected from the group consisting of pyrazogyl, F-5231, nipyrapclofen, KPP-300, sulfentrazone, pentozaone, flupropacil, M&B-39279, thidiazimin, carfentratzone-ethyl, pyraflufen-ethyl, oxadiargyl, azafenidine, fluazolate, butafenacil, oxadiazon and benzfendizone.

5. A mixture comprising (A) thidiazuron or thidiazuron and diuron and (B) one or more PPO inhibitors selected from the group consisting of pyrazogyl, F-5231, nipyrapclofen, KPP-300, sulfentrazone, pentozaone, flupropacil, M&B-39279, thidiazimin, carfentratzone-ethyl, pyraflufen-ethyl, oxadiargyl, azafenidine, fluazolate, butafenacil, oxadiazon and benzfendizone.

11. A mixture comprising (A) thidiazuron or thidiazuron and diuron and (B) one or more PPO inhibitors of the formula (I)

W--V (I),

where the symbols in the formula (I) have the meanings: ##STR41##

and ##STR42##

or ##STR43##

and ##STR44##

or ##STR45##

and ##STR46## R.sup.1 is hydrogen or halogen; R.sup.2 is halogen, alkyl, alkoxy, haloalkoxy or haloalkyl; R.sup.3 is hydrogen, alkyl, haloalkyl, alkoxy, haloalkoxy, alkyl-S(O).sub.n --, dialkylamino, alkylamino, amino or halogen; R.sup.4 is hydrogen, alkyl, haloalkyl, alkenyl, haloalkenyl, alkynyl, haloalkynyl, formyl, alkyl--CO-- or amino; R.sup.5 is hydrogen, halogen, alkyl, haloalkyl or nitro; R.sup.6 is hydrogen, alkyl or haloalkyl; R.sup.7 is hydrogen, alkyl or haloalkyl; R.sup.8 is hydrogen, alkyl, haloalkyl, alkenyl, haloalkenyl, alkynyl or haloalkynyl; R.sup.9 is hydrogen, alkyl, halogen, alkoxy, haloalkyl, haloalkoxy, alkoxy carbonyl, haloalkoxycarbonyl or amino; R.sup.10 is hydrogen, alkyl, halogen, alkoxy, haloalkyl, haloalkoxy, alkoxy carbonyl, haloalkoxycarbonyl or amino; R.sup.11 is hydrogen or alkyl; R.sup.12 is hydrogen, alkyl or halogen; R.sup.13 is hydrogen, halogen, alkyl, haloalkyl, alkoxy, haloalkoxy, cyano, nitro, amino, alkylamino, dialkylamino, alkoxy carbonyl, -(C.dbd.O)NH.sub.2, -(C.dbd.S)NH.sub.2, hydroxyl, acyloxy, substituted phenyl, substituted phenoxy, substituted benzyl or substituted benzyloxy; R.sup.14 is hydrogen, alkyl, haloalkyl, alkoxyalkyl, haloalkoxyalkyl, alkenyl, haloalkoxyalkenyl, alkynyl, haloalkynyl, alkoxy, haloalkoxy, haloalkenyloxy, alkynyloxy, haloalkynyloxy, halogen, --O--COR.sup.15, --OH, --S(O).sub.n R.sup.15, --COR.sup.17, --CONR.sup.18 R.sup.19, --CO.sub.2 R.sup.20, --(CR.sup.6 R.sup.7).sub.n --CO.sub.2 R.sup.20, --CR.sup.6 R.sup.7) --CR.sup.21.dbd.CR.sup.22 CO.sub.2 R.sup.20, --CN, --CR.sup.11 (X.sup.1 R.sup.23) (X.sup.2 R.sup.24), --NR.sup.11 --(CR.sup.6 R.sup.7).sub.n --CO.sub.2 R.sup.20, --O--(CR.sup.6 R.sup.7).sub.n --CO.sup.2 R.sup.20, --S(O).sub.n --CR.sup.21.dbd.CR.sup.22 --C(O)NR.sup.16 R.sup.17, --(CR.sup.6 R.sup.7).sub.n CONR.sup.16 R.sup.17, --(CR.sup.6 R.sup.7).sub.n CO.sub.2 R.sup.20, --NO.sub.2, --NR.sup.16 R.sup.17, --NR.sup.24 SO.sub.2 R.sup.15 or --NR.sup.23 COR.sup.15 ; R.sup.15 is hydrogen, M, alkyl, haloalkyl, alkenyl, haloalkenyl, alkynyl, haloalkynyl or halogen; R.sup.16 is hydrogen, alkyl, haloalkyl, alkenyl, haloalkenyl, alkynyl, haloalkynyl or halogen; R.sup.17 is hydrogen, OH, OM, alkyl, haloalkyl, alkenyl, haloalkenyl, alkynyl, haloalkynyl, alkoxyalkyl or haloalkoxyalkyl; R.sup.18 is hydrogen, alkyl, alkoxy, alkenyl, haloalkenyl, alkynyl or haloalkynyl; R.sup.19 is hydrogen, alkyl, alkoxy or R.sup.18 and R.sup.19 together with the nitrogen atom form a 5-, 6- or 7-membered ring which may be interrupted by oxygen or sulfur; R.sup.20 is hydrogen, M, alkyl, haloalkyl, alkenyl, haloalkenyl, alkynyl, haloalkynyl, alkoxyalkyl, haloalkoxyalkyl or --(CR.sup.6 R.sup.7).sub.n --CO.sub.2 R.sup.15 ; R.sup.21 is hydrogen, alkyl, halogen or CN; R.sup.22 is hydrogen, alkyl, halogen or CN; R.sup.23 is hydrogen or alkyl; R.sup.24 is hydrogen, alkyl or R.sup.23 and R.sup.24 together are a substituted or else unsubstituted 5-, 6- or 7-membered cyclic acetal or thioacetal; R.sup.25 is hydrogen, alkyl, alkoxy, alkenyl, haloalkenyl, alkynyl, haloalkynyl, carbamoyl or thiocarbamoyl; M is an alkali metal, alkaline earth metal or ammonium ion; X.sup.1 is identical or different and is C-R.sup.5 or N; X.sup.2 is identical or different and is CR.sup.2 R.sup.6, O, --S(O).sub.n -- or NR.sup.25 ; Y.sup.1 is O or S; Y.sup.2 is O or S; n, are 0, 1 or 2; U.sup.1 is O, S(O).sub.n, NR.sup.23 or CR.sup.9 R.sup.10. U.sup.2 is S(O).sub.n, CR.sup.9 R.sup.10 or C.dbd.O; T is CR.sup.2 R.sup.6, NH or NR.sup.2.